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| 10/721,579 | 11/24/2003 | David D. Swenson | 020048-001710US | 5797 |

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TOWNSEND AND TOWNSEND AND CREW, LLP
TWO EMBARCADERO CENTER
EIGHTH FLOOR
SAN FRANCISCO, CA 94111-3834

| EXAMINER | |
|---|---|
| CALAMITA, HEATHER | |
| ART UNIT | PAPER NUMBER |
| 1637 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|---|---|---|
| 3 MONTHS | 02/06/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/721,579 | SWENSON, DAVID D. | |
| | Examiner | Art Unit | |
| | Heather G. Calamita, Ph.D. | 1637 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *01 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) *18-32* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Status of Application, Amendments, and/or Claims*

1. Claims 1-32 are currently pending. Claims 1-17 are under examination. Claims 18-32 are withdrawn as being directed to non-elected subject matter. Any objections and rejections not reiterated below are hereby withdrawn.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Kong et al. (Marine Pollution Bulletin, 1999).

With regard to claim 1, Kong et al. teach a method of testing the integrity of primers in a multiplex amplification reaction, the amplification reaction comprising primers sufficient to amplify at least two different target sequences, the method comprising,

a) providing in a mixture the primers and a single-stranded polynucleotide sequence comprising the sequences of the primers, subsequences of the primers at least five nucleotides long, or complements of the sequences of the primers (see p. 806 col. 2, where the target DNA is the single-stranded sequence as ds DNA in a multiplex PCR reaction becomes single-stranded upon denaturation and the sequence comprises the sequence of the forward primer, for example in Table 2 the forward primers are between 18 and 20 nucleotides in length meeting the limitation of at least 5 nucleotides long)

b) amplifying the polynucleotide sequence (see p. 806 col. 2, where the target DNA is subjected to PCR; and

c) detecting the presence or absence of the amplified polynucleotide, thereby testing the integrity of the primers in the amplification reaction (see Figure 2 where the presence or absence of the amplicons are detected using an agarose gel and are an indication of the primer integrity).

With regard to claim 2, Kong et al. teach wherein the target sequences are less than 50% identical to each other (see p. 805 col. 2 lines 6-21, where Kong et al. teach no signifigant sequence similarity was found in the homology search between *Vibrio cholerae*, *S. enterica*, *E. coli* and *Aeromonas* species).

With regard to claim 3, Kong et al. teach the single-stranded polynucleotide sequence is provided by denaturing a double-stranded polynucleotide (see p. 806 col. 2, where the target DNA is the single-stranded sequence as ds DNA in a multiplex PCR reaction becomes single-stranded upon denaturation).

With regard to claim 4, Kong et al. teach the single-stranded polynucleotide sequence is a synthetic single-stranded polynucleotide (see p. 806 col. 2, where the target DNA is the single-stranded sequence as ds DNA in a multiplex PCR reaction becomes single-stranded upon denaturation. Additionally all DNA is synthetic as the production of DNA both ex vivo and in vivo is a synthetic process).

With regard to claim 5, Kong et al teach the single stranded polynucleotide sequence comprises the primer sequences (see p. 806 col. 2, where the target sequence necessarily comprises the primer sequences. To have successful amplification the primers must hybridize with the target sequence).

With regard to claim 6, Kong et al. teach the single-stranded polynucleotide sequence comprises subsequences of the primers at least five nucleotides long (see p. 806 col. 2 and Table 2, where the primer sequences are between 18 and 23 nucleotides in length and therefore meet the limitation of at least 5 nucleotides in length).

With regard to claim 7, Kong et al. teach the single-stranded polynucleotide sequence comprises all subsequences of the primers that are nine nucleotides long (see p. 806 col. 2 and Table 2, where the primer sequences are between 18 and 23 nucleotides in length and therefore meet the limitation of at least

9 nucleotides in length).

With regard to claim 8, Kong et al. teach the single-stranded polynucleotide comprises at least two subsequences of each primer, wherein the combination of the at least two subsequences contain every nucleotide of the primer sequence (see Table 2, where the primer sequences are between 18 and 23 nucleotides in length and the combination of two subsequences of the primers contain every nucleotide of the primer for example the target necessarily comprises the primer sequence in its entirety. For example primers having 18 nucleotides is comprised of 9 dinucleotide subsequences, therefore the single stranded polynucleotide target would comprises two dinucleotide subsequences of each primer).

With regard to claim 9, Kong et al. teach the single-stranded polynucleotide sequence comprises two subsequences of a primer sequence and at least the last two nucleotides of a first subsequence are identical to the first at least two nucleotides of a second subsequence (see Table 2, where the target sequence necessarily comprises the primer sequences. For example primers having 18 nucleotides is comprised of 9 dinucleotide subsequences, therefore the single stranded polynucleotide target would comprises two dinucleotide subsequences of each primer. It is well known in the art that primers for PCR are designed to be complementary to the target sequence).

With regard to claim 10, Kong et al. teach at least the last five nucleotides of the first subsequence are identical to at least the first five nucleotides of the second subsequence (see Table 2, where the target sequence necessarily comprises the primer sequences. For example primers having 20 nucleotides is comprised of four pentanucleotide subsequences, therefore the single stranded polynucleotide target would comprises two pentanucleotide subsequences of each primer. It is well known in the art that primers for PCR are designed to be complementary to the target sequence).

With regard to claim 11, Kong et al. teach the mixture comprises at least a first, second, and third primer and the single-stranded polynucleotide sequence comprises the sequences of the at least first, second and third primer or subsequences at least five nucleotides long of the at least first, second and

third primers (see Table 2, where the target sequence necessarily comprises the primer sequences. For example primers having 20 nucleotides is comprised of four pentanucleotide subsequences, therefore the single stranded polynucleotide target would comprises two pentanucleotide subsequences of each primer. It is well known in the art that primers for PCR are designed to be complementary to the target sequence).

With regard to claim 12, Kong et al. teach the mixture comprises primers sufficient to amplify at least three target sequences (see Table 2, where eight primer sets are disclosed for eight target sequences).

With regard to claim 13, Kong et al. teach the amplification of the target sequences is performed in the same reaction as the amplification of the single-stranded polynucleotide sequence (see p. 806, where the reaction is a multiplex PCR reaction and the target sequence is the single stranded polynucleotide sequence).

With regard to claim 14, Kong et al. teach the mixture comprises a first primer pair and the single-stranded polynucleotide sequence comprises sequences, or complement thereof, of primers of the first primer pair oriented such that the first primer pair is capable of amplifying the remaining primer sequences, or subsequences thereof, in the single-stranded polynucleotide (see p. 806 col. 2, where the target DNA is the single-stranded sequence as ds DNA in a multiplex PCR reaction becomes single-stranded upon denaturation and the sequence comprises the sequence of the forward primer, for example in Table 2 the forward primers are between 18 and 20 nucleotides in length meeting the limitation of at least 5 nucleotides long).

With regard to claim 15, Kong et al. teach the mixture comprises at least a second primer pair comprising a forward and a reverse primer, wherein the single-stranded polynucleotide sequence comprises sequences or subsequences of the at least second primer pair oriented such that the reverse primer sequence or subsequence is closer to the 5' end of the polynucleotide sequence than the forward primer sequence or subsequence (see p. 806 where the multiplex PCR comprises single-stranded polynucleotide sequence which comprises the forward and reverse primer sequences).

With regard to claim 16, Kong et al. teach the single-stranded polynucleotide sequence comprises subsequences of the primers at least five nucleotides long (see p. 806 col. 2 and Table 2, where the primer sequences are between 18 and 23 nucleotides in length and therefore meet the limitation of at least 5 nucleotides in length).

With regard to claim 17, Kong et al. teach the single-stranded polynucleotide sequence comprises all subsequences of the primers that are nine nucleotides long (see p. 806 col. 2 and Table 2, where the primer sequences are between 18 and 23 nucleotides in length and therefore meet the limitation of 9 nucleotides in length).

***Response to Arguments***

3. Applicant's arguments filed December 1, 2006, have been fully considered but they are not persuasive.

With respect to the 102 (b) rejections of claims 31-17, Applicant argues Kong does not teach an amplification reaction comprising primers sufficient to amplify at least two different target sequences from a single stranded polynucleotide. This argument is not persuasive because Kong clearly teaches the amplification of 8 different target sequences using 8 different primer pairs. This meet the limitation of "***at least two different targets***" recited in claim 1. Additionally, Applicant argues the method of Kong would not have resulted in a single-stranded polynucleotide sequence comprising sequences or subsequences of the primers used to amplify at least two different targets. This argument is not persuasive because Kong does teach amplification of at least two different targets as Kong teaches the amplification of 8 different targets. The instant claims do not require the product be a single stranded polynucleotide. Finally, as outlined in detail in the rejection above Kong does teach a single stranded polynucleotide for amplification at p. 806 col. 2, where the target DNA is the single-stranded sequence, because ds DNA in a multiplex PCR reaction becomes single-stranded upon denaturation. Finally, the target DNA comprises sequences or subsequences of the primers because the primers are designed from

the target sequence and necessarily are subsequences of the target sequence.

Applicant argues claim 1 recites that the single-stranded polynucleotide comprises "the sequences of the primers, subsequences of the primers at least five nucleotides long or complements of the sequences of the primers" and the Examiner has misinterpreted the language to read on simple PCR. This argument is not persuasive, the Examiner refers Applicants to MPEP 2111 which states the claims must be give their broadest reasonable interpretation consistent with the specification. Here the claims are correctly interpreted and the invention as claimed is not misunderstood by the Examiner. Additionally, Kong teaches multiplex PCR (see p. 803 col. 2, under *PCR amplification*) which necessitates at least two different targets are amplified. Applicant argues that simple multiplex PCR includes at most two different target polynucleotides, one possibly comprising one set of primer sequences and a second target polynucleotide comprising the second set of primer sequences, but not one polynucleotide comprising all four primer sequences. This argument is not persuasive because Kong meets the limitations of the instant claims. Kong teaches 8 different target polynucleotides and 8 different primers where the primers are necessarily subsequences of their respective target polynucleotide. The claims do not require one polynucleotide sequence comprise four primer sequences.

***Conclusion***

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

***Correspondence***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Heather G. Calamita whose telephone number is 571.272.2876 and whose e-mail address is heather.calamita@uspto.gov. However, the office cannot guarantee security through the e-mail system nor should official papers be transmitted through this route. The examiner can normally be reached on Monday through Thursday, 7:00 AM to 5:30 PM.

If attempts to reach the examiner are unsuccessful, the examiner's supervisor, Gary Benzion can be reached at 571.272.0782.

Papers related to this application may be faxed to Group 1637 via the PTO Fax Center using the fax number 571.273.8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to 571.272.0547.

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hgc

GARY BENZION, PH.D
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600